

ISO/TS 13434:2020 (E)

Geosynthetics — Guidelines for the assessment of durability

Contents

	Foreword
1	Scope
2	Normative references
3	Terms, definitions, symbols and abbreviated terms
3.1	Terms and definitions
3.2	Symbols
3.3	Abbreviated items
4	Generalized procedure
4.1	General
4.2	Available and required properties
4.2.1	Condition of acceptability
4.2.2	Development of the required and available properties with time
4.3	Design life
4.4	Margin of safety
4.5	End of life (function)
4.6	Durability study
5	Constituents of geosynthetics
5.1	Types of geosynthetic
5.1.1	Polymeric durability considerations
5.1.2	Geotextiles
5.1.3	Geosynthetic barriers or polymeric and bituminous geosynthetic barriers
5.1.4	GBR-C
5.1.5	Geoblankets (GBL)
5.1.6	Geogrids
5.1.7	Geonets
5.1.8	Geocells
5.1.9	Geomats
5.1.10	Geocomposites
5.1.11	Geofoam
5.1.12	Geospacers
5.2	Individual polymer types
5.2.1	General
5.2.2	Polypropylene (PP)
5.2.3	Flexible polypropylene (fPP)
5.2.4	Polyethylene (PE)
5.2.5	Polyesters (i.e. PET, PEN)
5.2.6	Flexible polyvinyl chloride (PVC-P)
5.2.7	Polyamides (PA)
5.2.8	Ethylene propylene diene monomer (EPDM)
5.2.9	Ethylene interpolymer alloy (EIA)
5.2.10	Chlorinated polyethylene (CPE)
5.2.11	Chlorosulfonated polyethylene (CSPE)
5.2.12	Bitumen
5.2.13	Aramid
5.2.14	Polyvinyl alcohol (PVAL)
5.2.15	Polystyrene (PS)
5.2.16	Typical physical properties of polymeric geosynthetics
5.3	Manufacturing process
5.3.1	General
5.3.2	Geotextiles

- 5.3.2.1 General
- 5.3.2.2 Non-woven geotextiles
- 5.3.2.3 Woven and knitted geotextiles
- 5.3.3 Geosynthetic barriers
- 5.3.4 Geogrids
- 5.3.5 Geonets
- 5.3.6 Geocomposites
- 5.3.7 Geocells
- 5.3.8 GBR-C
- 5.4 Recycled and reworked materials
- 5.5 Additives, stabilizers, fillers and reinforcement scrims
 - 5.5.1 General
 - 5.5.2 Antioxidants
 - 5.5.3 Acid scavengers
 - 5.5.4 Metal ion deactivators
 - 5.5.5 UV stabilizers
 - 5.5.6 Plasticizers
 - 5.5.7 Lubricants
 - 5.5.8 Mineral fillers
 - 5.5.9 Scrims
- 6 Environmental factors that may lead to degradation
 - 6.1 The environment above ground
 - 6.2 The environment below ground
 - 6.3 Chemical and biological effects on a geosynthetic
 - 6.3.1 General
 - 6.3.2 Hydrolysis of PET and PA
 - 6.3.3 Oxidation of PE and PP
 - 6.3.4 Biochemical attack
 - 6.3.5 Chemical effects on other geosynthetic barriers
 - 6.4 Effects of load and mechanical damage
 - 6.4.1 Tensile load: Creep and creep-rupture
 - 6.4.2 Synergy of tensile load with environmental effects (environmental stress cracking)
 - 6.4.3 Effect of mechanical load on weathering and oxidation
 - 6.4.4 Loading during installation: Mechanical damage
 - 6.4.5 Normal pressure: Compressive creep and penetration
 - 6.4.6 Abrasion and dynamic loading
- 7 Evidence of the durability of geosynthetics
 - 7.1 Historical development
 - 7.2 Empirical evidence of durability from geosynthetics extracted from the soil
 - 7.2.1 Geotextiles
 - 7.2.2 Geosynthetic barriers
 - 7.2.3 Geogrids
 - 7.3 Summary
- 8 Procedure for assessment of durability
 - 8.1 General
 - 8.1.1 Need for testing
 - 8.1.2 Testing concepts for lifetime index tests
 - 8.1.3 Scope of durability assessment
 - 8.2 Procedure
 - 8.2.1 Material
 - 8.2.2 Function and application
 - 8.2.3 Environment
 - 8.2.4 Mechanism of degradation
 - 8.2.5 Design life
 - 8.2.6 The “end-of-life” criterion
 - 8.3 Degradation during storage and installation
 - 8.3.1 Weathering
 - 8.3.2 Mechanical damage
 - 8.4 Short-, medium-, and long-term applications
 - 8.5 Assessment of long-term durability
 - 8.5.1 General

- 8.5.2 Evidence from service
- 8.5.3 Accelerated testing
 - 8.5.3.1 General
 - 8.5.3.2 Increasing frequency
 - 8.5.3.3 Increasing severity
 - 8.5.3.4 Increasing temperature
 - 8.5.3.5 Examples of chemical degradation and accelerated testing
 - 8.5.3.5.1 Oxidation
 - 8.5.3.5.2 Internal hydrolysis
 - 8.5.3.5.3 Resistance to alkalis and acids under aerobic conditions
 - 8.5.3.5.4 Resistance to biological effects
- 8.6 Prediction of durability
 - 8.6.1 Statement of the durability
 - 8.6.2 Level of confidence
- 8.7 Planning for future inspection

Page count: 42